

A REDESCRIPTION OF THE SOFT CORAL *ALCYONIUM VALDIVIAE*
KÜKENTHAL, 1906, WITH THE DESCRIPTION OF A NEW SPECIES OF
LITOPHYTON FORSKÅL, 1775, FROM SOUTHERN AFRICA
(OCTOCORALLIA, ALCYONACEA)

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(With 8 figures)

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ABSTRACT

Two presumably endemic species of soft corals are described from the shallow sublittoral of southern Africa. A redescription of *Alcyonium valdiviae* Kükenthal, 1906 (family Alcyoniidae), is presented, with a brief assessment of its variability, as well as a comparison with related southern African taxa. Previous authors have confused this species with *Cladiella pachyclados* (Klunzinger, 1877). The present re-evaluation, based on recently collected material, confirms that *C. pachyclados* is not part of the fauna of the south coast of South Africa.

A recently discovered species of the genus *Litophyton* Forskål, 1775 (family Nephtheidae), is here described as *Litophyton liltvedi* sp. nov., and is compared with other sympatric and superficially similar species. This description represents the first record of the genus for the subcontinent.

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INTRODUCTION

Recent exploration of the shallow sublittoral of South Africa by means of SCUBA and dredge has yielded many new species and records of soft corals as well as newly acquired material of many previously described species that have not been collected for the past 60-90 years.

From Dr G. C. Williams, Curator of Lower Invertebrates, South African Museum, Cape Town, Dr J. Verseveldt received some alcyonacean specimens for examination. Among these were five colonies of a soft coral, similar specimens of

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which were previously identified as *Alcyonium pachyclados* Klunzinger, 1877, by Hickson (1900: 72) and J. Stuart Thomson (1910: 570; 1921: 50). The generic designation for *A. pachyclados* is now recognized as *Cladiella* Gray, 1869, based on the form and distribution of sclerites (Tixier-Durivault 1966: 50). It was found that the recently collected material mentioned above is conspecific with *Alcyonium valdiviae* Kükenthal, 1906.

Another colony received represents a new species of *Litophyton* Forskål, 1775, an Indo-Pacific genus previously unrecorded from the coasts of southern Africa.

Since the death of Dr Verseveldt on 29 March 1987 precluded the possibility of the referees' comments being incorporated into the original manuscript, Dr J. C. den Hartog (Curator of Coelenterata at the Rijksmuseum van Natuurlijke Historie, Leiden), long-time associate and friend of Dr Verseveldt, suggested that Dr Williams make the necessary revisions of the manuscript and act as co-author. This has been effected, together with the redrawing of the figures portraying the polyps and sclerites, and the inclusion of scanning electron micrographs as well as a map showing the geographic distribution of the two species.

SYSTEMATIC ACCOUNT

Family **Alcyoniidae** Lamouroux, 1812

Alcyonium Linnaeus, 1758

Alcyonium valdiviae Kükenthal, 1906

Figs 1, 2A, C-E, 3

Alcyonium valdiviae Kükenthal, 1906: 42, pl. 3 (fig. 11), pl. 8 (figs 39-41).

Alcyonium pachyclados (*non* Klunzinger, 1877): Hickson, 1900: 72. J. Stuart Thomson, 1910: 570, pl. 2 (fig. 14), pl. 4 (figs 33, 34); 1921: 155-156, pl. 5 (figs 6-8).

Material

SAM-H3347, 1 colony (Fig. 1A, B), reef 2 km off Bird Rock, Algoa Bay, 33°50'S 25°40'E, depth 15 m, SCUBA, 17 May 1984, coll. G. C. Williams. SAM-H3661, 1 colony, Gonubie, Eastern Cape Province, Station XX38, 32°51,2'S 28°02,8'E, depth 30 m, dredge, 17 July 1981, coll. G. C. Williams (RV *Meiring Naude*). SAM-H3384, 1 colony (Fig. 1D), off Gans Bay, Western Cape Province, 34°36,6'S 19°12,6'E, depth 78 m, 11 October 1983, coll. Sea Fisheries Research Institute. SAM-H3732, 1 colony (Fig. 1C), Hottentots Huisie, Cape Peninsula, 33°59'S 18°21'E, depth 14 m, SCUBA, 22 March 1984, coll. G. C. Williams. SAM-H3409, 1 colony (Fig. 1E), off Danger Point, Cape Province, 34°40'S 19°17'E, depth 42 m, SCUBA, 13 April 1984, coll. W. R. Liltved.

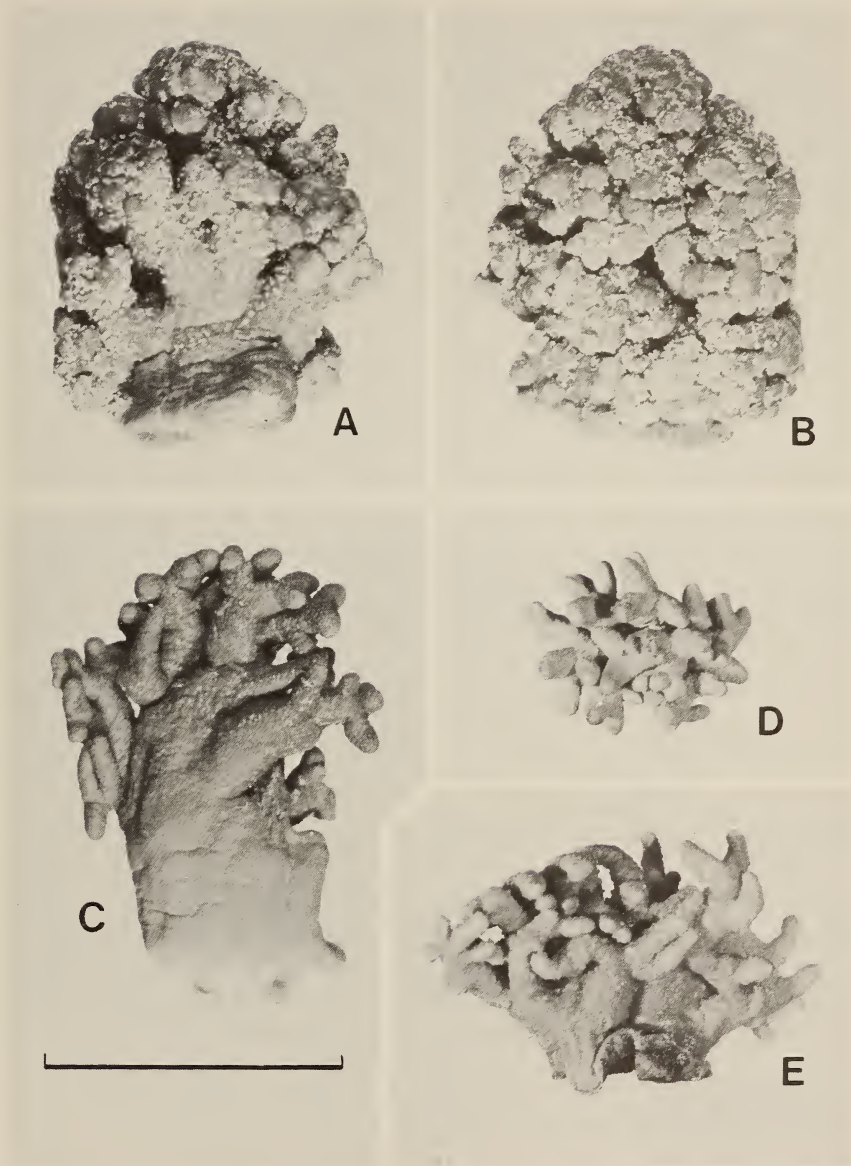


Fig. 1. *Alcyonium valdiviae* Kükenthal, 1906. A-B. SAM-H3347. C. SAM-H3732. D. SAM-H3384. E. SAM-H3409. Scale = 40 mm.

*Description**External features* (Figs 1A–E, 2A)

The colony (SAM–H3347) (Fig. 1A, B) measures 53 mm in total height, of which the stalk comprises 10 mm. The latter is laterally flattened and measures 22 mm at its greatest width. The polyparium is also slightly flattened. It consists of numerous closely set, round, sometimes rather conical, small lobes, 2–4 mm in diameter; these lobes are united into groups at the ends of twigs.

Many polyps are extended. Owing to their white colour they contrast distinctly with the dark-red colour of the polyparium. The anthocodiae protrude above the surface of the lobes for a distance of up to 0,20 mm (Fig. 2A). The tentacles are 0,40–0,50 mm long. At their bases they are swollen, about 0,13 mm wide, tapering distally to a sharp point. On either side they bear one row of 10–15 thin pinnules, 0,12–0,14 mm long. The polyps are entirely devoid of sclerites.

Sclerites (Figs 2C–D, 3A–I)

The rigid surface layer of the polyparium and stalk is densely packed with small capstans, which are primarily eight-radiates and six-radiates. The length of these sclerites is usually 0,05 mm and does not exceed 0,07 mm. There are also some four-radiates, as well as some three-radiates, 0,025–0,04 mm in length. The interior of the colony is devoid of sclerites.

Colour

The whole colony is orange-red, the polyps are white.

Variability

The five colonies differ in shape and in colour. The colony depicted in Figure 1C has a long, broad stalk. The specimens shown in Figure 1D–E have short stalks. The lobes may be short and conical, long and conical, or finger-shaped (Fig. 1C–E). The colony represented in Figure 1C is orange distally, but towards the base is light pink. The colony shown in Figure 1D is yellowish-grey; that in Figure 1E is pinkish-beige. The specimen from Gonubie (SAM–H3661— not illustrated) is bright yellow; this colony has a few extended polyps.

Distribution (Fig. 2E)

South coast of South Africa.

Remarks

It is unknown to the authors whether Kükenthal's type specimen is still kept in some museum or collection, so it could not be investigated.

Some of the specimens may superficially resemble members of the genus *Cladiella* but, for the following reasons, cannot be included in that genus: *Cladiella* species contain double heads (see Bayer *et al.* 1983, figs 159, 160)

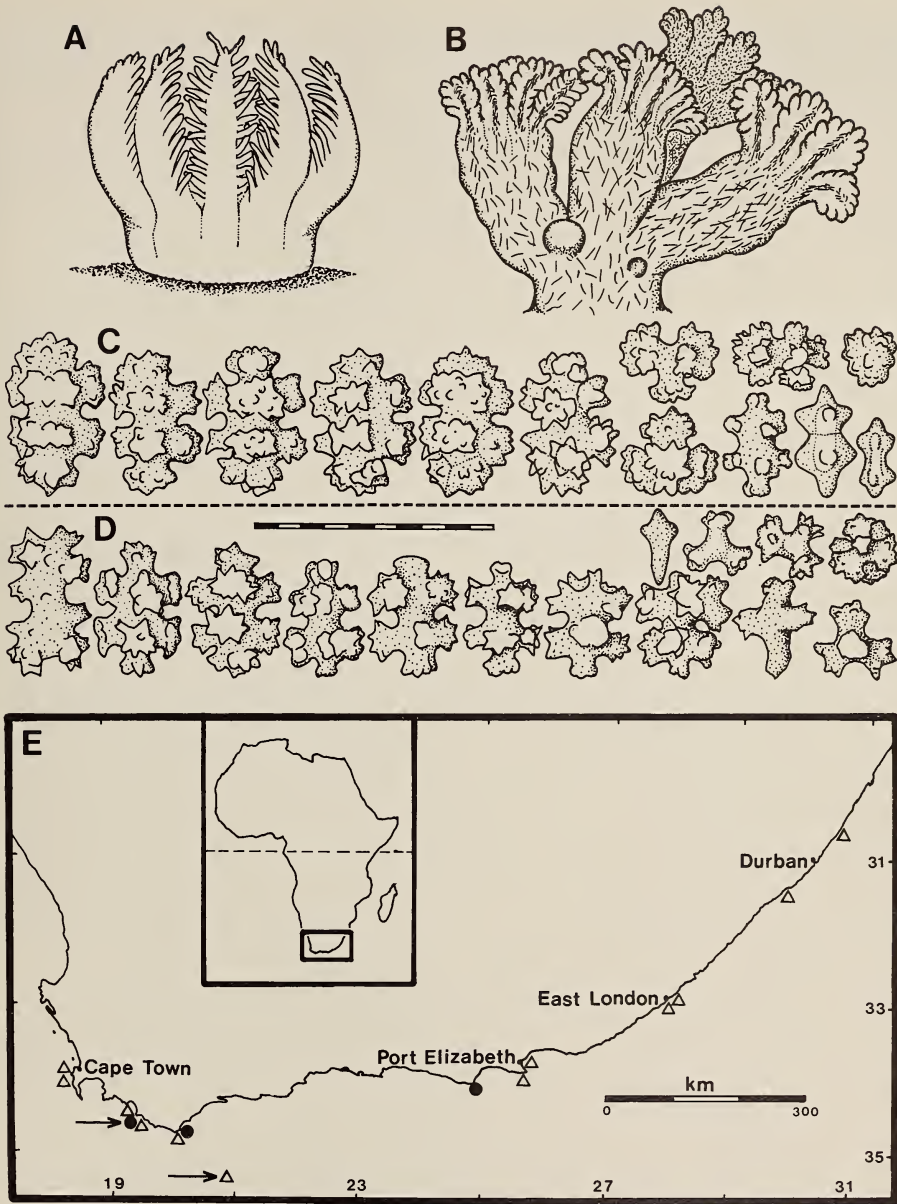


Fig. 2. A. *Alcyonium valdiviae* Kükenthal, 1906. A single polyp, 0,6 mm in height. B. *Litophyton litvedii* sp. nov. A terminal lappet of four mature and two budding polyps, showing arrangement and relative density of sclerites in the polyp walls and tentacles. Total height of figure represents 3,3 mm. C–D. Sclerites of *Alcyonium valdiviae*. C. Sclerites from the surface of a lobe from the polyparium. D. Sclerites from the surface of the stalk. Total length of scale bar for C and D = 0,1 mm. E. Map of southern Africa showing collecting stations for *Alcyonium valdiviae* (▲) and *Litophyton litvedii* (●). Arrows indicate type localities.

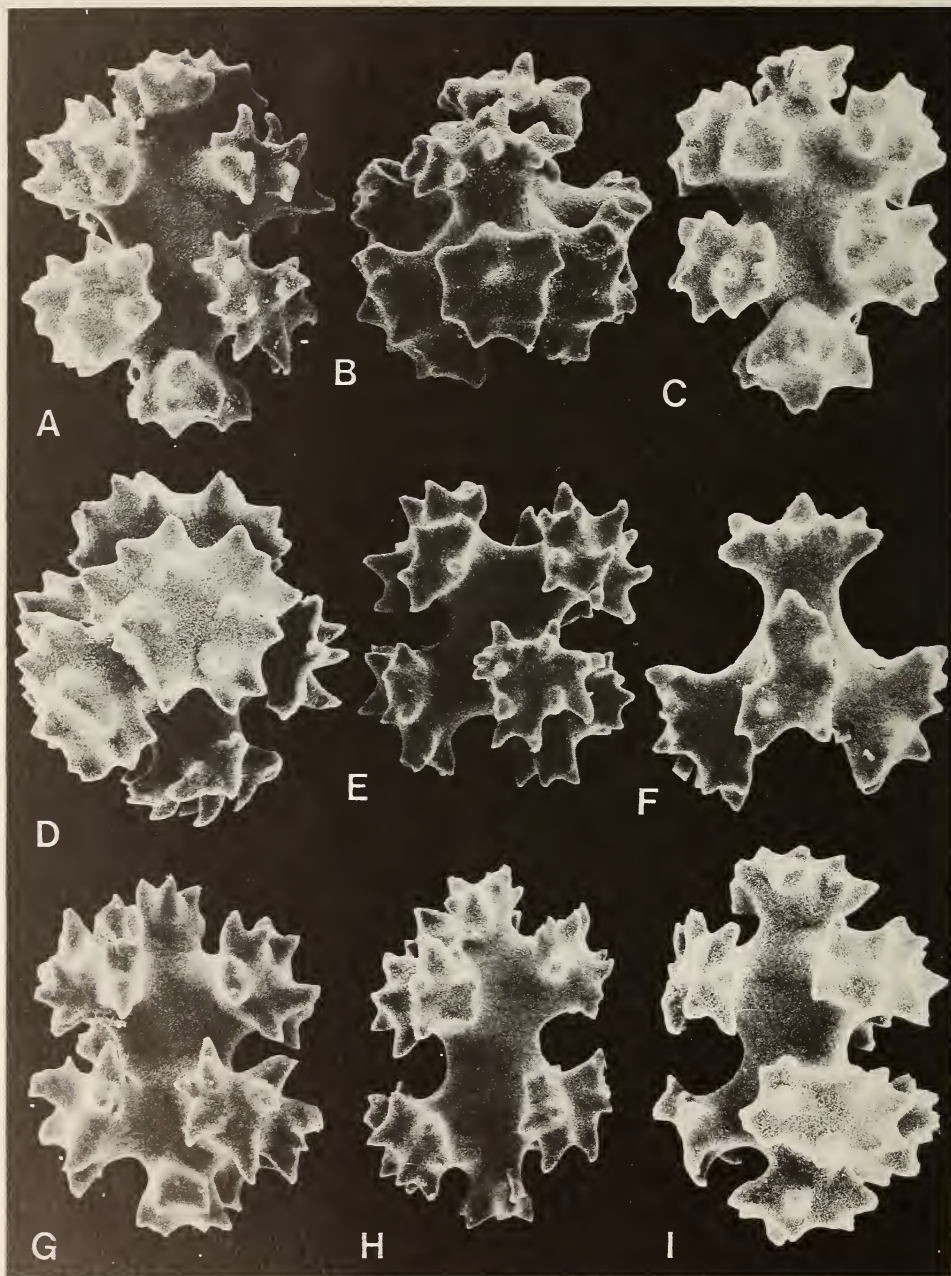


Fig. 3. *Alcyonium valdiviae* Kükenthal, 1906. Scanning electron micrographs of sclerites. A–D. Sclerites from the surface of a lobe from the polyparium. A. 0,053 mm. B. 0,042 mm. C. 0,053 mm. D. 0,048 mm. E–I. Sclerites from the surface of the stalk. E. 0,049 mm. F. 0,037 mm. G. 0,048 mm. H. 0,058 mm. I. 0,052 mm.

without terminal clusters of warts; the present specimens have capstans (see Bayer *et al.* 1983, figs 148–150). In all *Cladiella* species the interior contains sclerites; these are absent in the present specimens. *Cladiella* species have typical finger-biscuit-like sclerites in the surface layer of the lobes and/or in the polyps and/or in the tentacles; these are absent in the present specimens.

Hickson (1900) and J. Stuart Thomson (1910, 1921) referred the specimens examined by them to *Alcyonium pachyclados* Klunzinger, 1877 (a species that correctly belongs to the genus *Cladiella*). Although accurate in assigning the generic name *Alcyonium* to their material, they were incorrect as regards the specific identity for the above-stated reasons and since *Cladiella pachyclados* possesses coenenchymal sclerites that are much larger (up to 0,12 mm in length).

Alcyonium rutilum (Tixier-Durivault, 1954) from northern Natal closely resembles *A. valdiviae*. The two species can be differentiated as follows: *A. valdiviae* varies in colour from white to pink, yellow, orange, or orange-red, and possesses sclerites of capstans mostly 0,05–0,07 mm in length; *A. rutilum*, on the other hand, is deep wine-red or dark red and the sclerites (also capstans) do not exceed 0,04 mm in length. *Alcyonium rutilum* is known only from the holotype. Additional material is necessary to assess the extent of the intraspecific variation and to determine if it is truly distinct from *A. valdiviae*.

Family **Nephtheidae** Gray, 1862

Litophyton Forskål, 1775

Litophyton liltvedi sp. nov.

Figs 2B, E, 4–8

Material

SAM–H3393, holotype, off Danger Point, Cape Province, 34°38'S 19°20'E, depth 31 m, SCUBA, 10 April 1984, coll. W. R. Liltved.

Description

External features (Figs 2B, 4A–B)

The roughly circular, more or less flat, soft colony has diameters of 80 mm and 90 mm. On one side, where the excentrically situated stalk is found, the thickness of the colony is 35 mm; on the opposite side it is 10 mm thick. The holdfast is oval in shape, with diameters of 12–18 mm and 40 mm. (In Fig. 4B it is the dark patch at the lower side of the photograph.) From the stalk two stems arise: a short one, which passes into a small part of the polyparium, and a larger one, which is much branched and bears a larger part of the polyparium.

The upper side of the colony is covered with lobes. The larger ones are 10–15 mm wide. The extended polyps measure 1,60–2,50 mm in total height, the anthocodiae are 0,95–1,30 mm long (Fig. 2B). The extended tentacles, which are 0,60–0,70 mm long, have a single row of 5–7 pinnules on each side.

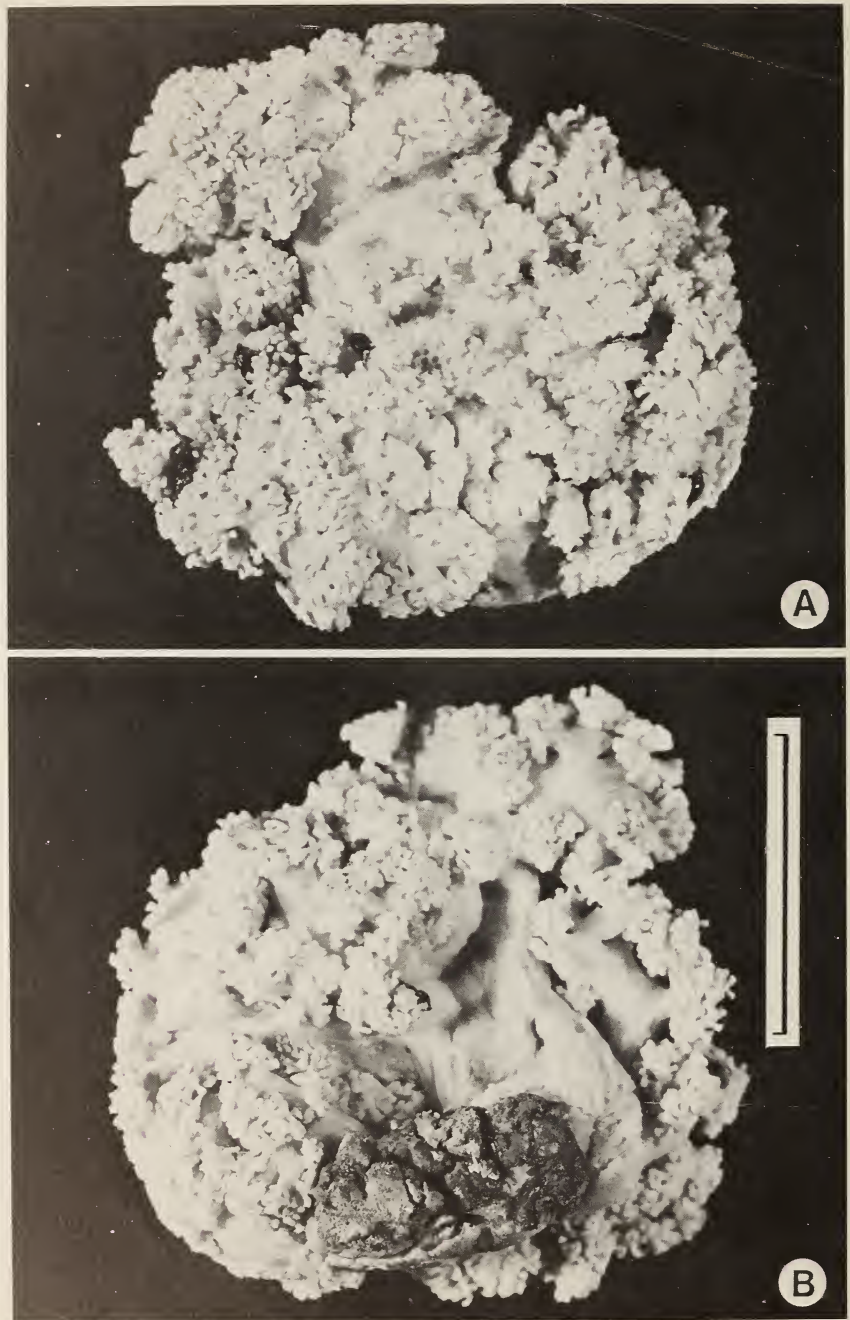


Fig. 4. *Litophyton liltvedi* sp. nov. SAM-H3393, holotype. A. Seen from above. B. Seen from below. Scale = 40 mm.

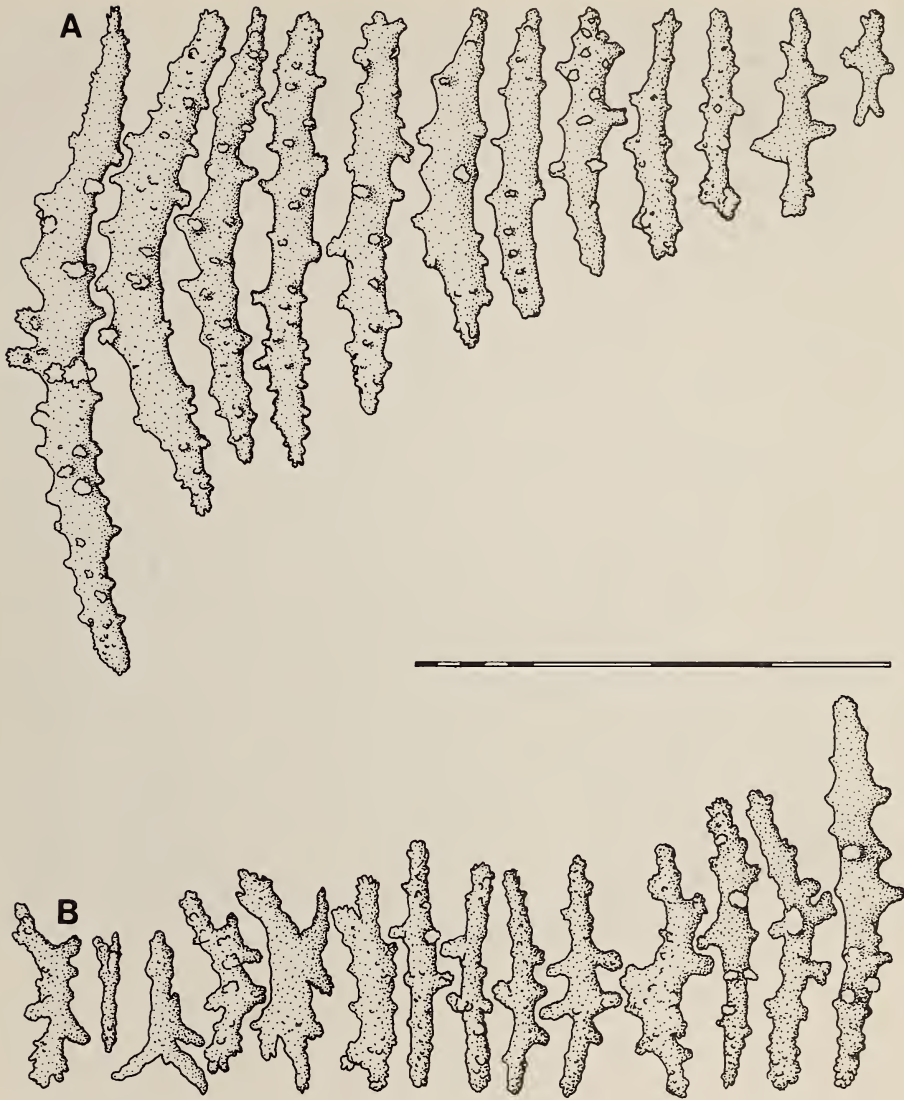


Fig. 5. *Litophyton liltvedi* sp. nov., holotype. A. Sclerites from the polyp wall. B. Sclerites from the tentacles. Entire scale bar represents 0.2 mm.

Sclerites (Figs 5–8)

The tentacles contain many spiny and wed spindles 0.05–0.16 mm in length (Figs 5B, 7A–F); in the base of the rachis the spindles are longitudinally arranged, while distally they are shorter and are arranged more or less *en chevron*.

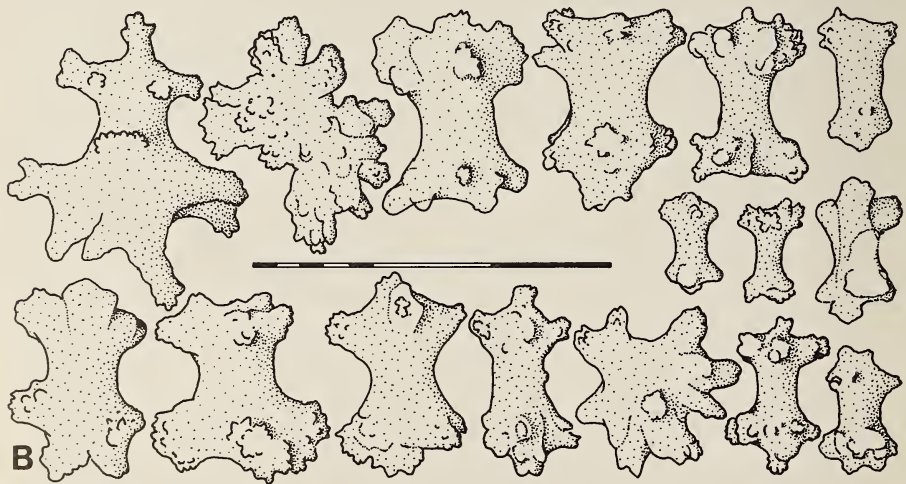
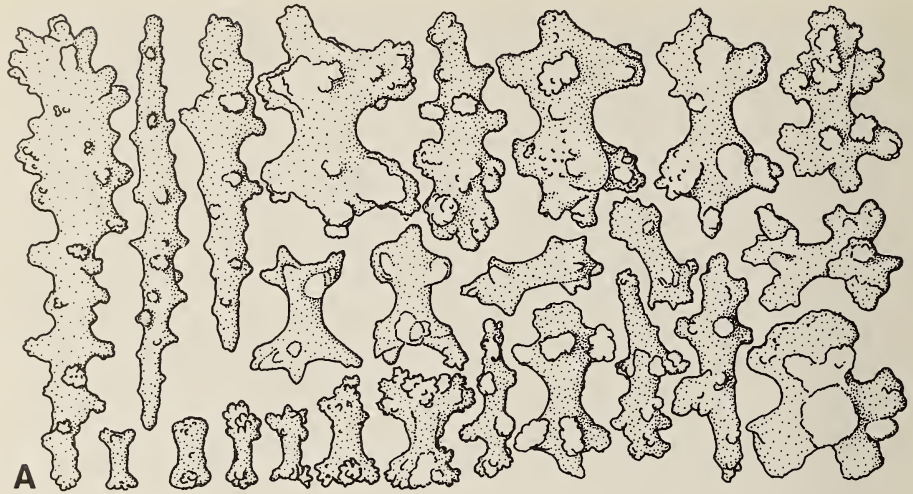


Fig. 6. *Litophyton litvedii* sp. nov., holotype. A. Sclerites from the surface of a lobe from the polyparium. B. Sclerites from the surface of the stalk. Entire length of scale bar represents 0,15 mm.

The anthocodial wall contains spiny spindles (Figs 5A, 7G-L), usually more or less longitudinally placed, but they often lie crisscross, and thus do not present a typical crown-and-points arrangement (Fig. 2B). Proximally their length is 0,20-0,28 mm; towards the tentacles they are shorter, about 0,05-0,10 mm.

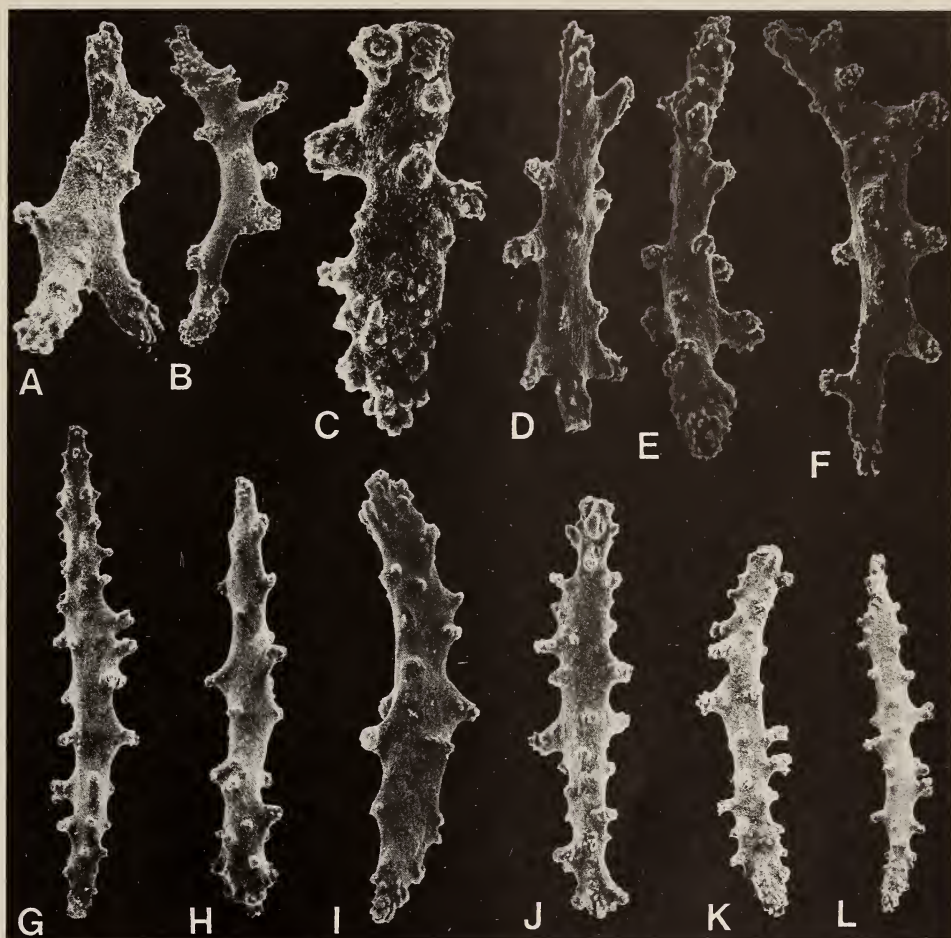
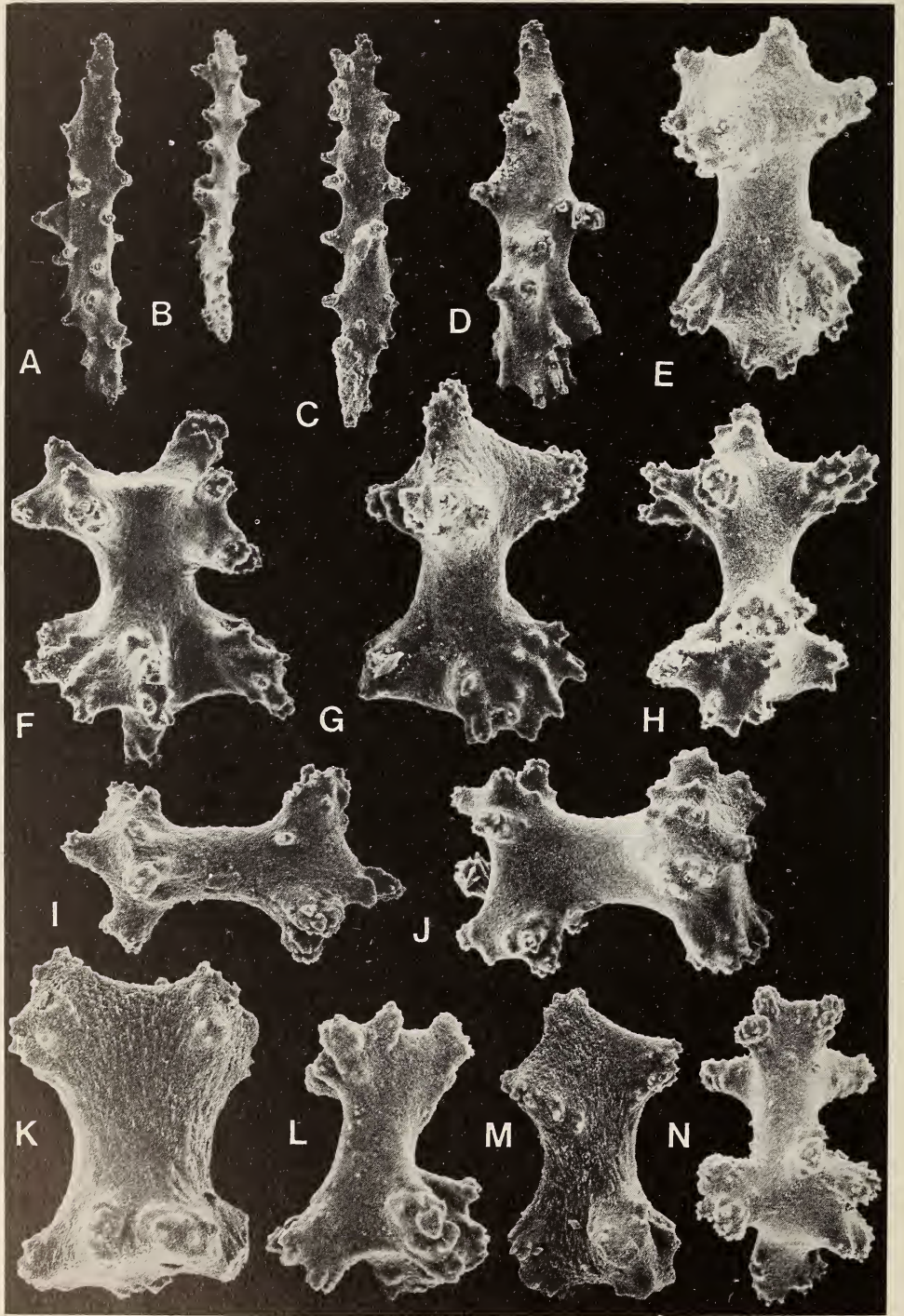


Fig. 7. *Litophyton liltvedii* sp. nov. Scanning electron micrographs of sclerites. A-F. Sclerites from the tentacles. A. 0,074 mm. B. 0,120 mm. C. 0,063 mm. D. 0,080 mm. E. 0,105 mm. F. 0,108 mm. G-L. Sclerites from the polyp wall. G. 0,212 mm. H. 0,163 mm. I. 0,150 mm. J. 0,150 mm. K. 0,155mm. L. 0,200 mm.

The surface layer of the polyparium and stalk contains many tiny double stars (usually 0,075 mm long, but ranging between 0,025 mm and 0,12 mm) with a proportionally long 'waist' (Figs 6A, B, 8E-N). In addition, in the surface layer of the terminal branches there are some spiny spindles, 0,08-0,20 mm long (Figs 6A, 8A-D). The two types of sclerites are not particularly densely set; in the interior of the colony sclerites are very scarce or absent.

Colour

In alcohol the colony is cream.



Etymology

Litophyton liltvedi is named for Mr W. R. Liltved, who collected the specimen on which this description is based.

Distribution (Fig. 2E)

South coast of South Africa.

Remarks

At first sight the colony resembles the type specimen of the alcyoniid *Alcyonium fauri*, as illustrated by J. Stuart Thomson (1910, pl. 1 (fig. 5)). However, in important respects the present specimen differs from the type of that species. According to Thomson the colony of *A. fauri* is encrusting, fairly hard, and the lobes are closely adjacent. The colony of *L. liltvedi* sp. nov. is not encrusting, and it is not hard but weak and flexible. The lobes do not arise from a lamella but rather from a fleshy polyparium, and the latter is provided with few rather than numerous spicules. Finally, in *A. fauri* the sclerites are up to 0,12 x 0,09 mm. Unfortunately, Thomson's figures of these sclerites (1910, pl. 4 (fig. 44)) are far from clear; with difficulty they can be discerned as double heads or dumb-bells with a very short waist. They are totally different from the double stars in *L. liltvedi* sp. nov. Examination of recently collected material referable to *A. fauri* has shown that a variety of coarsely tuberculated coenenchymal sclerites are evident, including robust spindles, wart clubs, double heads, and eight-radiates. Double stars are absent altogether.

The only other southern African soft coral that resembles *L. liltvedi* sp. nov. in its cauliflower-like appearance, is the nephtheid *Capnella thyrsoides* Verrill, 1865. The two are distinguished by the fact that the genus *Capnella* possesses many coenenchymal sclerites that are leaf clubs, whereas *Litophyton* is altogether lacking in leaf clubs.

The new species is referred to the genus *Litophyton* on the following grounds: (a) the colony branches repeatedly, and (b) the polyps are not retractile, they lack a supporting bundle, they are arranged in terminal catkins, and the anthocodial sclerites are not leaf clubs.

Small sclerites, but a little larger than the tiny double stars in the holotype, also occur in other *Litophyton* species, e.g. *L. stuhlmanni* (May, 1899) and *L. confertum* Kükenthal, 1903.

Fig. 8. *Litophyton liltvedi* sp. nov. Scanning electron micrographs of sclerites. A-H. Sclerites from the surface of a lobe from the polyparium. A. 0,210 mm. B. 0,155 mm. C. 0,180 mm. D. 0,125 mm. E. 0,085 mm. F. 0,090 mm. G. 0,083 mm. H. 0,075 mm. I-N. Sclerites from the surface of the stalk. I. 0,090 mm. J. 0,075 mm. K. 0,078 mm. L. 0,065 mm. M. 0,090 mm. N. 0,090 mm.

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